

REMARKS

Claims 6-18 are pending in this application, with claims 6 and 19 being the only independent claims. Claim 19 has been newly added. Claims 8, 9, 14, and 17 have been canceled. Claims 6, 7, 15, and 18 have been amended.

The specification has been objected to for allegedly introducing new matter.

Claims 14 and 17 have been rejected under 35 U.S.C. §112, first paragraph for failing to comply with the written description requirement.

Claim 6 has been rejected under 35 U.S.C. §102(b) as anticipated by U.S. Patent Appl. Pub. No. US 2002/0076337 (Rexroth).

Claims 7, 8, and 12 have been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth in view of U.S. Patent No. 6,524,078 (Brooks).

Claim 9 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth in view of U.S. Patent No. 3,808,830 (Atkinson), and further in view of JP 590118297 (Inoue).

Claim 10 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth.

Claim 11 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth, Atkinson, and Inoue, and further in view of U.S. Patent No. 5,297,940 (Buse).

Claim 13 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth in view U.S. Patent No. 5,372,730 (Warner).

Claim 14 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth and Warner, and in further view of U.S. Patent No. 6,479,915 (Hsuch).

Claim 15 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth, Warner, and Hsuch, and as an “obvious design choice”.

Claim 16 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth in view of U.S. Patent No. 4,812,108 (Kotera).

Claim 17 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth, Kotera, and Hsuch.

Claim 18 has been rejected under 35 U.S.C. §103(a) as unpatentable over Rexroth, Kotera, and Hsuch, and as an “obvious design choice”.

Objection to the specification

The Office Action states that the specification has been objected to because it introduces that the water displacer 210 is “compressible”, which is allegedly new matter.

The specification has been amended to remove the assertion that the water displacer 210 is “compressible”.

Applicant submits that this objection has been overcome.

Rejection of claims 14 and 17 under 35 U.S.C. §112, first paragraph

The Office Action states that claims 14 and 17 have been rejected for failing to comply with the written description requirement. Claims 14 and 17 have been canceled. Therefore, this rejection is now moot.

Rejection of claim 6 under 35 U.S.C. §102(b)

The Office Action states that Rexroth teaches all of Applicant’s recited elements.

Independent claim 1 has been amended to recite a submersible motor-driven pond pump that includes an “anti-freeze apparatus installed in at least one of the housings for protecting the

shaft, the anti-freeze apparatus comprising an elastomeric mount that elastically mounts and holds the impeller on the shaft, and an elastomeric diaphragm mounted at a low point in the intake housing, the diaphragm being expandable when subjected to ice pressure”, which Rexroth, Brooks, Atkinson, and Inoue, fail to teach or suggest. Support for the claim amendments can be found in original claim 8 and 9 and paragraph [0020] of Applicant’s specification.

Rexroth discloses a water-cooled pump motor for delivering potable water in a demand system. The motor of Rexroth includes a centrifugal pump that includes a volute and an impeller in the volute, an electric motor driving the impeller having a hollow rotor shaft, a rotor on the shaft, bearings supporting the rotor shaft, a stator coaxially outward of the rotor, two water impervious liners. One liner is located within the stator and the other line is located coaxially outside the rotor. The liners of Rexroth are spaced to define a cylindrical passageway across the rotor and a cooling and lubricating water passageway for water to flow through the motor including flow from the impeller between the rotor shaft and the bearings, across the cylindrical passageway and through the hollow rotor shaft back into the volute (see Abstract of Rexroth)

The Examiner asserts that Rexroth teaches a submersible motor-driven pond pump. Applicant disagrees.

According to Rexroth, “[I]n the field of potable water systems, there is a continuing need for improvement in an electrically driven water pump that can be used for systems of the demand type; that is, a system in which there is a remote store of potable water which may be gravity fed or stored in any source which does not require the water supply to furnish water at a required outlet pressure at a desired flow rate. Such systems are often referred to as demand systems. The need for improvement is particularly apparent in the case of demand systems for use on aircraft where the supply of water is desired to be maintained at or near ambient pressure in the aircraft

rather than under pressure. This substantially reduces the possibility of leaks from a fully pressurized tank of water or from any of its distribution conduits, which deliver pressurized water to any distribution point. Aircraft and their systems are subject to the repeated cycling of ambient pressure which occurs during the normal takeoff, flying at cruising altitude and in landing. Repeated cycling of pressurized structures gives rise to joint failure, particularly where the conduits and joints are at an elevated delivery pressure rather than static ambient pressure.” (see paragraphs [0001] and [0002] or Rexroth).

Clearly, the pump of Rexroth is intended to be operated above water and receive water from a gravity driven source and provide additional pressure. In other words, the pump of Rexroth is not submersible, as is Applicant’s recited pond pump. Nowhere in Rexroth is the potable pump described as being submersible.

Further, the Examiner concedes that Rexroth fails to teach or suggest the subject matter of claims 8 and 9, which is now incorporated into Applicant’s amended claim 1.

The Examiner, however, cites col. 4, lines 9-12 and element 51 of Brooks as teaching the anti-freeze apparatus comprises an elastomeric mount, which supports the shaft in the impeller (Applicant’s original claim 8).

Brooks discloses a pond pump that includes a housing 1 enclosing a synchronous motor 9 with a drive shaft 40 on which an impeller 20 is loosely fitted so that, on start up, the shaft (40) can rotate relative to the impeller 20 until a pair of diametrically opposed keyways 43 on the shaft engage and entrain keyways 27 on the impeller 20 to rotate it continuously in one direction. If the drive shaft of Brooks initially rotates in the opposite direction, pegs 25 on the rear face of the impeller 20 engage with a detent 60 located behind the impeller 20 to stop the rotation until the motor 9 restarts and rotates the drive shaft 43 in the first direction. One end of the drive shaft

40 is received in a first bearing 50 mounted in the housing 1, the other end of the shaft is received in a blind bore 28 in the impeller 20 which is coaxial with the axis of rotation of the shaft 40. The impeller 20 has a spigot 23 extending from the front face thereof which is received in a second bearing 50a in the housing 1 (See Abstract of Brooks).

The cited passages of Brooks read, “[a]s can be better seen from FIG. 9, the rotor 40 comprises a moulded plastics shaft 40 having a recessed mid-section 41 in which a magnet 42 is fixedly mounted.” The cited passages of Brooks mention nothing regarding “the anti-freeze apparatus comprises an elastomeric mount which supports the shaft in the impeller”, as recited in Applicant’s claim 8.

Although the cited passages of Brooks fail to teach or suggest the subject matter of original claim 8, claim 6 has been amended to include a clarified version of the subject matter of claim 8. Specifically, claim 6 now recites the limitation “anti-freeze apparatus installed in at least one of the housings for protecting the shaft, the anti-freeze apparatus comprising an elastomeric mount that elastically mounts and holds the impeller on the shaft”.

Brooks teaches that impeller 20 is mounted on tubular section 46 and that rubber bushes 51 and 51a are mounted on bearings 50 and 50a. The bearing 50 and rubber bush 51 are mounted on spigot 44 of tubular section 43 of the shaft 40, and the bearing 50a and rubber bush 51a are mounted on spigot 23 of the impeller 23 (see Figs. 3, 7, 9, and 10, and col. 3, line 62 to col. 4, line 6, and col. 4, lines 54-64 of Brooks). In other words, neither the rubber bush 51 nor the rubber bush 51a elastically mounts and holds the impeller 20 on the shaft 46, as recited in Applicant’s claim 6.

The Examiner also cites Inoue as teaching the anti-freeze apparatus further mounted at a low point in the intake housing, and cites col. 2, lines 45-53, col. 4, lines 3-22, and element 124

of Atkinson as teaching that the anti-freeze apparatus comprises a diaphragm that is expandable when subjected to ice pressure (Applicant's original claim 9), and that it would have been obvious to one skilled in the art to combine the references. Applicant disagrees.

Inoue discloses absorbing the volumetric expansion of water when it freezes by a static vane 10. The static vanes 10 of Inoue are disposed at the inner peripheral surface of an annular groove 4d and close to an opening 1e at the side of the side faces of four sets of water paths 1c by the end face 10a of the outer rim (see Fig. 3 of Inoue). In other words, the static vanes of Inoue are not mounted at a low point in the intake housing, as recited in Applicant's amended claim 6.

Atkinson discloses a freeze actuated suction throttling valve for use in an automobile air conditioning system between the evaporator and the compressor to maintain refrigerant temperature within the evaporator above a temperature, which will cause the evaporator to accumulate frost on its exterior surfaces. The throttling valve of Atkinson includes a valve member upstream from a valve seat, which is movable toward a closed position by an actuator also upstream from the valve seat. The actuator of Atkinson includes a rigid cup-shaped member filled with water and includes a flexible diaphragm 124 covering its one end. When the water freezes, the resulting expansion distorts the flexible diaphragm 124 and moves the valve member toward a closed position (see Abstract of Atkinson).

Although Atkinson discloses a diaphragm 124 that is responsive to the expansion of ice, the purpose of diaphragm 124 is to move the valve member towards a closed position to restrict the flow of refrigerant in an air-conditioning system (see col. 4, lines 3-23 of Atkinson).

Water pumps do not in any way involve regulating the flow of refrigerant. One skilled in the art would not have any reason to look to Atkinson for an elastic diaphragm that is responsive to the expansion of ice. The Examiner has used impermissible hindsight to selectively pick a

single feature from an unrelated technology to achieve Applicant's recited invention. Therefore, combining Atkinson with any of the other references is improper.

Further, one skilled in the art would have no reason to combine Rexroth and Brooks. Specifically, Rexroth is directed to potable water pump, and is not submersible. Further, Rexroth fails to teach or suggest that the shaft is ceramic. Consequently, one skilled in the art would not have reason to be concerned with the shaft of Rexroth breaking due to pressure from freezing water. Thus, one skilled in the art would have no reason to combine the rubber bushes of Brooks with the potable water pump of Rexroth. Further, if one skilled in the art were to combine the teachings of Rexroth and Brooks, the result would be a shaft that has rubber bushing mounted on one end and an impeller mounted on the other end with another rubber bush mounted on the impeller, which is not the same structural configuration recited in Applicant's claim 6.

Moreover, one skilled in the art would have no reason to combine the static vanes of Inoue with the teachings of Rexroth and Brooks because the teachings are incompatible. There would be no way for one skilled in the art to incorporate the static vanes of Inoue into the pump of Rexroth. Further, even if one skilled in the art were to combine the teachings of Rexroth and Inoue, the result would not be Applicant's recited invention. Instead, the pump of Rexroth would include static vanes disposed on the side of the pump, rather than an anti-freeze apparatus mounted at a low point in the intake housing, as recited in Applicant's claim 6.

Therefore, Rexroth, Brooks, Atkinson, and Inoue, fail to teach or suggest, whether taken alone or in combination, fail to teach or suggest a submersible motor-driven pond pump that includes an "anti-freeze apparatus installed in at least one of the housings for protecting the shaft, the anti-freeze apparatus comprising an elastomeric mount that elastically mounts and holds the impeller on the shaft, and an elastomeric diaphragm mounted at a low point in the intake

housing, the diaphragm being expandable when subjected to ice pressure”, as recited in Applicant’s claim 6.

Accordingly, claim 1 is patentable over Rexroth, Brooks, Atkinson, and Inoue under 35 U.S.C. §102(b) and §103(a).

Rejection of claims 7, 8, and 12 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth and Brooks teaches all of Applicant’s recited elements.

Rexroth and Brooks have been previously discussed and fail to teach or suggest the invention recited in Applicant’s amended independent claim 6.

Claim 8 has been canceled. Claims 7 and 12, which depend from independent claim 6, incorporate all of the limitations of independent claim 6 and are, therefore, deemed to be patentably distinct over Rexroth and Brooks for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 9 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Atkinson, and Inoue teaches all of Applicant’s recited elements. Claim 9 has been canceled. Therefore, this rejection is moot.

Rejection of claim 10 under 35 U.S.C. §103(a)

The Office Action states that Rexroth teaches all of Applicant’s recited elements.

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant’s amended independent claim 6.

Claim 10, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 11 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Atkinson, Inoue, and Buse teaches all of Applicant's recited elements.

Rexroth, Atkinson, and Inoue have been previously discussed and fail to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth, Atkinson, and Inoue fail to teach or suggest the subject matter recited in independent claim 6, and because Buse does not teach or suggest the recited subject matter of independent claim 6 that Rexroth, Atkinson, and Inoue are missing, the addition of Buse to the reference combination does not remedy the deficiencies of Rexroth, Atkinson, and Inoue.

Claim 11, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth, Atkinson, Inoue, and Buse for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 13 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth and Warner teaches all of Applicant's recited elements.

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth fails to teach or suggest the subject matter recited in independent claim

6, and because Warner does not teach or suggest the recited subject matter of independent claim 6 that Rexroth is missing, the addition of Warner to the reference combination does not remedy the deficiencies of Rexroth.

Claim 13, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth and Warner for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 14 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Warner, and Hsuch teaches all of Applicant's recited elements. Claim 14 has been canceled. Therefore, this rejection is now moot.

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth fails to teach or suggest the subject matter recited in independent claim 6, and because Warner and Hsuch do not teach or suggest the recited subject matter of independent claim 6 that Rexroth is missing, the addition of Warner and Hsuch to the reference combination does not remedy the deficiencies of Rexroth.

Claim 14, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth, Warner, and Hsuch for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 15 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Warner, and Hsuch teaches all of Applicant's recited elements except where the water displacer is one of a closed-cell foam plastic and an air-filled membrane, which is considered by the Examiner to an "obvious design choice".

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth fails to teach or suggest the subject matter recited in independent claim 6, and because Warner and Hsuch do not teach or suggest the recited subject matter of independent claim 6 that Rexroth is missing, the addition of Warner and Hsuch to the reference combination does not remedy the deficiencies of Rexroth.

Claim 15, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth, Warner, and Hsuch for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 16 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth and Kotera teaches all of Applicant's recited elements.

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth fails to teach or suggest the subject matter recited in independent claim 6, and because Kotera does not teach or suggest the recited subject matter of independent claim 6 that Rexroth is missing, the addition of Kotera to the reference combination does not remedy the

deficiencies of Rexroth.

Claim 16, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth and Kotera for at least those reasons discussed above with respect to independent claim 6.

Rejection of claim 17 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Kotera, and Hsuch teaches all of Applicant's recited elements. Claim 17 has been canceled. Therefore, this rejection is now moot.

Rejection of claim 18 under 35 U.S.C. §103(a)

The Office Action states that the combination of Rexroth, Kotera, and Hsuch teaches all of Applicant's recited elements except where the water displacer is one of a closed-cell foam plastic and an air-filled membrane, which the Examiner considers to be an "obvious design choice".

Rexroth has been previously discussed and fails to teach or suggest the invention recited in Applicant's amended independent claim 6.

Because Rexroth fails to teach or suggest the subject matter recited in independent claim 6, and because Kotera and Hsuch do not teach or suggest the recited subject matter of independent claim 6 that Rexroth is missing, the addition of Kotera and Hsuch to the reference combination does not remedy the deficiencies of Rexroth.

Claim 18, which depends from independent claim 6, incorporates all of the limitations of independent claim 6 and is, therefore, deemed to be patentably distinct over Rexroth, Kotera, and Hsuch for at least those reasons discussed above with respect to independent claim 6.

Newly added claim 19

Claim 19 has been newly added. Support for claim 19 can be found in original claims 1 and 8 and in Fig. 3 of Applicant's specification.

Claim 19 recites a submersible motor-driven pond pump that includes "anti-freeze apparatus installed in at least one of the housings for protecting the shaft, the anti-freeze apparatus comprising an elastomeric mount disposed between the shaft and the impeller that mounts and holds the impeller on the shaft", which Rexroth and Brooks, whether taken alone or in combination, fail to teach or suggest.

Rexroth has been discussed in detail above. The Examiner concedes that Rexroth fails to teach or suggest, "wherein the anti-freeze apparatus comprises an elastomeric mount which supports the shaft in the impeller", as recited in Applicant's original claim 8. However, as discussed above the Examiner cites col. 4, line 9-12 and element 51 of Brooks as teaching Applicant's recited limitation.

Also as discussed above, Brooks teaches that impeller 20 is mounted on tubular section 46 and that rubber bushes 51 and 51a are mounted on bearings 50 and 50a. The bearing 50 and rubber bush 51 are mounted on spigot 44 of tubular section 43 of the shaft 40, and the bearing 50a and rubber bush 51a are mounted on spigot 23 of the impeller 23 (see Figs. 3, 7, 9, and 10, and col. 3, line 62 to col. 4, line 6, and col. 4, lines 54-64 of Brooks). In other words, neither the rubber bush 51 nor the rubber bush 51a is disposed between the impeller 20 and the shaft 46 and

mounts and holds the impeller 20 on the shaft 46, as recited in Applicant's new claim 19.

Therefore, claim 19 is patentable over the cited references.

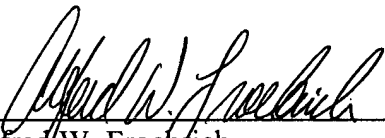
Conclusion

In view of the foregoing, Applicants respectfully request reconsideration and withdrawal of all rejections, and allowance of all pending claims in due course.

Should the Examiner have any comments, questions, suggestions, or objections, the Examiner is respectfully requested to telephone the undersigned in order to facilitate reaching a resolution of any outstanding issues.

Respectfully submitted,
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Dated: September 29, 2008